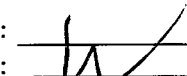
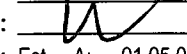


Date: Thursday, 9/11/2008 10:15:45 AM  
 User: Chantal Lavoie

## Process Sheet

<b>Customer</b> :	CU-DAR001 Dart Helicopters Services	<b>Drawing Name</b> :	ROUND BILLET 17-4
<b>Job Number</b> :	41966		
<b>Estimate Number</b> :	10040		
<b>P.O. Number</b> :		<b>Part Number</b> :	D6104005
<b>This Issue</b> :	9/11/2008	<b>S.O. No.</b> :	
<b>Prsht Rev.</b> :	NC	<b>Drawing Number</b> :	D6104 REV B
<b>First Issue</b> :	/ /	<b>Project Number</b> :	N/A
<b>Previous Run</b> :	39626	<b>Drawing Revision</b> :	B
	<b>Type</b> :	<b>Material</b> :	
	PURCHASED PARTS	<b>Due Date</b> :	9/26/2008
<b>Written By</b> :		<b>Qty:</b>	20
<b>Checked &amp; Approved By</b> :		<b>Um:</b>	Each
<b>Comment</b> :	Est. A: 01.05.08 New Issue EC		

## Additional Product

Job Number:



Seq. #:	Machine Or Operation:	Description :
---------	-----------------------	---------------

1.0	PG	PURCHASING
-----	----	------------



## Comment: PURCHASING

Issue P/O: 7144

a) Description: S.S round billet

b) Ø4.00" x 5.10" long

c) Tolerance on all dimensions are +0.030"/-0.000"

d) Material: 17-4PH Stainless steel (Ams 5643 or Aisi 630)

e) One blank makes 2 parts

f) Material certification required

C208/09/11

(20)

2.0	D6104005P	17-4 SS Roundbar 4.00"OD
-----	-----------	--------------------------



Comment: Qty.: 1.0000 Each(s)/Unit Total: 20.0000 Each(s)  
 17-4 SS Roundbar 4.00"OD

3.0	PACKAGING 1	PACKAGING RESOURCE #1
-----	-------------	-----------------------



## Comment: PACKAGING RESOURCE #1

Receive &amp; Inspect For Transit Damage

Ensure material certification is attached

Pc 8/9/22 (20)

4.0	QC6	DIMENSIONAL CHECK
-----	-----	-------------------



## Comment: DIMENSIONAL CHECK

Ensure Material certification comply to Dwg D6104

S08/10/2 (420)

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries

Date: Thursday, 9/11/2008 10:15:45 AM  
User: Chantal Lavoie

## Process Sheet

Customer: CU-DAR001 Dart Helicopters Services

Drawing Name: ROUND BILLET 17-4

Job Number: 41966

Part Number: D6104005

Job Number:



Seq. #:

Machine Or Operation:

Description :

5.0

PACKAGING 1

PACKAGING RESOURCE #1



Comment: PACKAGING RESOURCE #1

Identify and Stock

Location: \_\_\_\_\_

*pc 8/9/22 (20)*

6.0

QC21

FINAL INSPECTION/W/O RELEASE



*08/10/03*

Comment: FINAL INSPECTION/W/O RELEASE

Job Completion



*MF 08-10-03*

W/O:		WORK ORDER CHANGES					
DATE	STEP	PROCEDURE CHANGE	By	Date	Qty	Approval Chief Eng / Prod Mgr	Approval QC Inspector

Part No: \_\_\_\_\_ PAR #: \_\_\_\_\_ Fault Category: \_\_\_\_\_ NCR: Yes No DQA: \_\_\_\_\_ Date: \_\_\_\_\_

Resolution: \_\_\_\_\_ Disposition: \_\_\_\_\_ QA: N/C Closed: \_\_\_\_\_ Date: \_\_\_\_\_

NCR:		WORK ORDER NON-CONFORMANCE (NCR)						
DATE	STEP	Description of NC Section A	Corrective Action Section B			Verification Section C	Approval Chief Eng	Approval QC Inspector
			Initial Chief Eng	Action Description Chief Eng	Sign & Date			

**NOTE:** Date & initial all entries



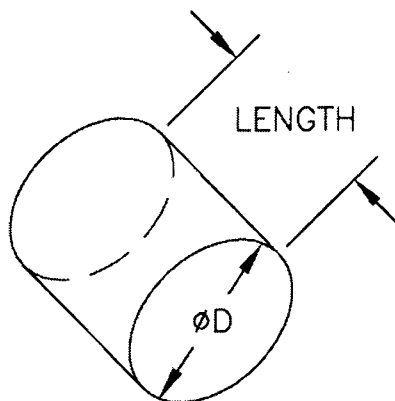
DESIGN 14	DRAWN BY 	DART AEROSPACE LTD HAWKESBURY, ONTARIO, CANADA	
CHECKED 	APPROVED 	DRAWING NO. D6104	Rev. B SHEET 1 OF 1
DATE 02.11.25		TITLE ROUND BILLET, 17-4	SCALE NTS
A	01.04.10	NEW ISSUE	
B	02.11.25	CLARIFY ALLOY SPEC ADDED D6104-009/-011 REDUCE LENGTH OF BILLETS	

RELEASED

02.11.25

## SPECIFICATION CONTROL DRAWING

SHOP COPY  
RETURN TO  
ENGINEERING  
UNCONTROLLED COPY  
SUBJECT TO AMENDMENT  
WITHOUT NOTICE  
WORK ORDER  
NO. 41966



MATERIAL: 17-4 PH SS (AMS 5643 OR AISI 630) MIN UTS = 170 KSI (38 HRC)

PURCHASE MATERIAL ACCORDING TO THE FOLLOWING TABLE. SPECIFY ALLOY, DIAMETER x LENGTH (+0.030/-0.000) AS SHOWN.

TOLERANCE ON ALL DIMENSIONS IS +0.030/-0.000.

ALL DIMENSIONS ARE IN INCHES

Part No.	Alloy	D (Diameter)	Length
D6104-001	17-4 PH STAINLESS STEEL	Ø3.00	3.80
D6104-003	17-4 PH STAINLESS STEEL	Ø3.25	3.80
D6104-005	17-4 PH STAINLESS STEEL	Ø4.00	5.10
D6104-007	17-4 PH STAINLESS STEEL	Ø4.50	5.10
D6104-009	17-4 PH STAINLESS STEEL	Ø5.25	4.10
D6104-011	17-4 PH STAINLESS STEEL	Ø6.50	4.10

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07-29-'08 09:11 FROM-

17-02 1000/010 1 001


 SYRACUSE  
NEW YORK 13201

# CERTIFICATE OF TEST

A M CASTLE, INC		S H A M CASTLE, INC		OUR ORDER NO. P5-12036-8-01	
3400 N WOLF RD		3400 N WOLF RD		DATE 07/24/08	
FRANKLIN PARK, IL 60131		FRANKLIN PARK, IL 60131		05	

CUSTOMER ORDER # & DATE 01-46304	CUSTOMER REQ. #	DISTRICT B PARSONS	SHIPPED FROM SYRACUSE
-------------------------------------	-----------------	-----------------------	--------------------------

## DESCRIPTION OF MATERIAL

CRU 17-4PH RTA IAC 42464  
 AMC-3174-31 REV 7 AMS-5643R ASTM-A564-04 TYPE 630 ASME-SA564-07ED T630  
 UNS-S17400  
 DFARS 252.225-7014 ALT 1

SIZE

4 RD

08/10/02

Solid 02

## HEAT NO.

## CHEMICAL ANALYSIS

HEAT NO.	C	MN	P	S	SI	NI	CR	MO	CU	CB	TA
A10038	.041	.63	.026	.024	.61	4.25	15.32	.22	3.18	.28	.010

CASTLE METALS CORP.

DATE RCVD 7/29/08

IAC 42464

APPROVED BY AS

QUANTITY	HEAT NO.	MECHANICAL PROPERTIES
----------	----------	-----------------------

QUANTITY	HEAT NO.	TENSILE PSI	YLD.2%PSI	%ELONG4D	RED/AREA%	HARDNESS BHN 341
4436 #	A10038					

CAPABILITY PHYSICALS AFTER 900 DEG. F. - 1 HR. AIRCOOL:

202,940	180,400	13.5	49.6	BHN 401
---------	---------	------	------	---------

MACRO TEST OK

MICRO TEST OK

FERRITE 3 %

 MATERIAL SOLUTION TREATED AT 1900 DEG. F. HELD 1 HOUR  
 AIRCOOLED.

AT TEMPERATURE -

 CRUCIBLE MATERIALS CORP. VENDOR #18610.  
 MATERIAL INGOT CAST.

NATTA - YES

 MATERIAL FREE FROM MERCURY CONTAMINATION AT TIME OF SHIPMENT  
 NO WELD REPAIR PERFORMED  
 MATERIAL MELTED IN U.S.A.

 THANK YOU FOR SELECTING A QUALITY PRODUCT  
 MANUFACTURED BY THE EMPLOYEES OF CRUCIBLE SPECIALTY METALS WE

SWORN TO AND SUBSCRIBED BEFORE ME THIS

DAY OF 20

NOTARY PUBLIC

JON PIKARSKY

CERTIFIED BY:

 THE ABOVE MATERIAL WAS MANUFACTURED AND TESTED IN ACCORDANCE WITH ABOVE SPECIFICATIONS AND IS IN CONFORMANCE WITH THE SPECIFICATION REQUIREMENTS.  
 CRUCIBLE MATERIALS CORPORATION  
 ACTING BY AND THROUGH ITS SPECIALTY METALS DIVISION  
 QUALITY ASSURANCE REPRESENTATIVE

## CERTIFICATE OF TESTS

CERT. SERIAL# 000650161

## ABNAHMEPRUEFZEUGNIS

## CERTIFICAT DE CONTROLE


**TALLEY METALS**  
 A Carpenter Company

 Talley Metals Technology, Inc.  
 205 Talley Metals Lane  
 McBee, SC. 29101 Tel: (610) 208-2000 (800) 338-4592

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06/24/08

CUSTOMER / BESTELLER / CLIENT

A.M. CASTLE &amp; CO

 3400 N WOLF RD  
 FRANKLIN PARK IL 60131

SELLER / VERKÄUFER / VENDEUR PAGE 1 OF 2

HVL

CUSTOMER ORDER NO. / BESTELL-NR. / N° DE COMMANDE	CARPENTER NO. / WERKS-NR. / N° DE REFERENCE INTERNE	DATE / DATUM / DATE	WEIGHT / GEWICHT / POIDS
01-46375-01	W90662	06/24/08	4095.000

HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE: G14507

 PRODUCT DESCRIPTION: TYPE 17-4 SOLUTION ANNEALED ROUGH TURNED  
 PART NUMBER: IAC 42464

 SPECIFICATION: CASTLE 3174-02 CAP OF COND. H900 REV 26 (07/15/05)  
 AMS 2303 REV E (10/ /01)  
 AMS 5543 REV R (02/ /08) (EXCEPT HOT ROLLED OR FORGED & ROUGH  
 TURNED)  
 ASTM-A564-04 TYPE 630  
 ASME-SA564 2007 EDITION AISI 630 UNS S17400

SIZE 4.000000 IN. (101.60 MM) RD BAR

PRIMARY HEAT CHEMISTRY (WT%): (TEST METHOD IS SHOWN IN PARENTHESIS)

C (COM)	MN (XRF)	SI (XRF)	P (XRF)	S (COM)	CR (XRF)
0.03	0.92	0.32	0.026	0.023	15.36
NI (XRF)	MO (XRF)	CU (XRF)	N (FUS)	CB (XRF)	TA (XRF)
4.31	0.32	3.79	0.034	0.27	LT .01
CB+TA					
0.28					

THIS HEAT MELTED BY THE ARC/AOD PROCESSES  
NO WELD REPAIR.MATERIAL IS MANUFACTURED FREE FROM MERCURY, RADIUM AND ALPHA SOURCE  
CONTAMINATION.

DISCS MACROETCHED AND APPROVED

HARDNESS AS SHIPPED, HBW - 362 (MIDRADIUS)

MAGNETIC PARTICLES: FREQUENCY = 0 / SEVERITY = 0

MICROSTRUCTURE - FERRITE 1.10%

SOLUTION ANNEALED - 1900 F, 1 HOUR - RAPID COOL

CASTLE METALS CORP.

DATE RCVD 6/24/08

IAC 42464

APPROVED BY *aw*

CONTINUED ON NEXT PAGE

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TO-

P033/046

**CERTIFICATE OF TESTS**

CERT. SERIAL# 000650161

**ABNAHMEPRUEFZEUGNIS****CERTIFICAT DE CONTROLE**
**TALLEY METALS**  
 A Carpenter Company

 Talley Metals Technology, Inc.  
 205 Talley Metals Lane  
 McBee, SC. 29101 Tel: (610) 208-2000 (800) 338-4592

06/24/08

CUSTOMER / BESTELLER / CLIENT

A.M. CASTLE &amp; CO

 3400 N WOLF RD  
 FRANKLIN PARK IL 60131

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SELLER / VERKAUFER / VENDEUR PAGE 2 OF 2

HVL

CUSTOMER ORDER NO. / BESTELL-NR. / N° DE COMMANDE	CARPENTER NO. / MERES-NR. / N° DE REFERENCE INTERNE	DATE / DATUM / DATE	WEIGHT / GEWICHT / POIDS
01-46375-01	W90662	06/24/08	4095.000

 HEAT NUMBER / SCHMELZE-NR. / N° DE COULEE:  
 CAPABILITY

G14507

900 F ( 482 C ), 01 HR

AIR COOL

YIELD STRENGTH, (0.20 %) KSI(MPA)	204.0 ( 1407 )
TENSILE STRENGTH, KSI(MPA)	209.0 ( 1441 )
ELONGATION IN 2.00", %	14.0
REDUCTION OF AREA, %	44.0
HARDNESS, HBW	413.0

(CONVERTED FROM TENSILE STRENGTH)

NO WELD REPAIR PERFORMED  
 MATERIAL PRODUCED ON THIS ORDER WAS MELTED AND MANUFACTURED IN THE U.S.A.  
 MATERIAL HAS BEEN MELTED IN USA OR QUALIFYING COUNTRY TO DFARS REQUIRE-  
 MENTS 252.225-7014 WITH ALTERNATE 1 FOR QUALIFYING COUNTRY 225.872.1.  
 WE HEREBY CERTIFY THAT THE ABOVE TEST DATA ARE IN ACCORDANCE WITH THE  
 PURCHASE ORDER AND SPECIFICATION REQUIREMENTS. CERTIFICATE OF TEST IS  
 PREPARED IN ACCORDANCE WITH PARAGRAPH 3.1B OF EN 10204(DIN50049)

 STEPHANIE E. MCCULLUM  
 QUALITY ASSURANCE ENGINEER  
 CARPENTER TECHNOLOGY CORPORATION

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